

Appl. No. : **10/759,925**
Filed : **January 16, 2004**

AMENDMENTS TO THE DRAWINGS

Please replace Figure 4A with the enclosed Figure 4A in appendix A.

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REMARKS

Objections to the Specification and Drawings

The Examiner objected to the specification due to errors in paragraphs 113 and 134. Applicants have amended the specification to correct these typographical errors.

The Examiner objected to the drawings because the bolt was referred to as both 32 and 33. Applicants have amended paragraph 98 to correct this typographical error. In the erroneous portion, the shaft and bolt were both referred to by the numeral 32. In a later reference to the bolt, the correct reference numeral 33 was used.

The Examiner also objected to the drawings due to the double use of the reference numerals 22 and 23. Figure 4A has been amended by changing reference numeral 22 to 22a, and reference number 23 to 23a. The specification has been amended to reflect these changes in paragraphs 98 and 99.

Paragraphs 37, 84 and 116 have been amended to employ all capital letter for trademarks. Applicants also note that the trademarks, VITON®, Karlez®, and Epsilon®, were accompanied by generic terms and the “®” symbol in the original specification.

The priority information has also been updated to reflect the patent number of the parent application, U.S. Patent No. 6,736,147.

The specification has also been amended to replace “?” with appropriate “μ” and “o” symbols.

Double Patenting Rejections

The Examiner rejected Claims 6-13 and 17-22 under the judicially created doctrine of obviousness-type double patenting over Claims 1-7 of U.S. Patent No. 6,736,147. Applicants have enclosed a Terminal Disclaimer in compliance with 37 CFR 3.72(b) and respectfully request that the double patenting rejections be withdrawn.

Indefiniteness Rejections

The Examiner rejected Claims 10 and 21 as being indefinite under 35 U.S.C. § 112, second paragraph, for not clearly describing the term “sealing element.” Applicants respectfully traverse the rejection, but have amended the Claims in order to expedite prosecution. The term

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sealing element has now been replaced with "valve body". This term is used in the specification in paragraph 98 and pointed out with reference numeral 30 in Figure 4A.

Rejections over EP 0697467

The Examiner rejected Claims 1-3, 6, and 12-17 under U.S.C. § 102(b) as being unpatentable over Shang, et al (EP 0697467). Examiner also rejected Claims 4, 5, 7, 18 and 19 as obvious under 35 U.S.C. 103(a). While Applicants respectfully traverse the rejections, Applicants have amended the claims to expedite prosecution.

Claims 1, 6 and 12 and their dependents were rejected as being anticipated by EP '467. Applicants respectfully traverse the rejections and submit that EP '467 does not teach the features of these independent claims. These claims now cite etch rates specific to a selected material. Specifically, EP '467 does not disclose "removing adhered deposits from CVD reactions on a wall of the reaction chamber at a rate of greater than **2.0 microns/minute.**" (Claims 1 and 6) Also, EP '467 does not disclose "removing adhered **silicon oxide** deposits from CVD reactions on a wall of the reaction chamber at a rate of greater than or equal to about **1.5 microns/minute.**"

Support for these amendments can be found in the specification. For example, the specification recites "undesirable silicon nitride adhering to the inner wall of the reaction chamber 2 was removed at greater than 2.0 microns/minute, more particularly at about 2.5 microns/minute." (Paragraph 111) Also, the specification recites "the silicon oxide was removed at a rate of about 1.5 $\mu\text{m}/\text{min}$ " (Paragraph 113).

Applicants point out that the etch rate limitation ("removing adhered deposits from CVD reactions on a wall of the reaction chamber at a rate of greater than 2.0 microns/minute") is itself a **positive method step** in the independent claims, which EP '467 does not disclose. Removing at the cited etch rate is in fact a positively recited step that is unknown in combination with the other steps. EP' 467 states lower maximum etch rates "the cleaning rate for as-deposited film has reached 2 micron/minute for silicon nitride and 1 micron/minute for silicon, doped silicon, and silicon oxide." Thus EP' 467 does not teach etch rates meeting the recitation of the independent claims.

Thus, Applicants submit that Claims 1, 6 and 12 are not anticipated by EP '467. Claims 3-5, 7, 8, and 15-19 depend from these claims and add features of particular utility.

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The non-obviousness of the pending claims, particularly with the recited high etch rates at the recited power ranges of a remote plasma chamber, is addressed below.

Obviousness Rejections over EP '467 in combination with Rajagopalan

The Examiner also rejects Claims 9-11 and 20-22 as being obvious under 35 U.S.C. 103(a) over EP '467 in combination with Rajagopalan, et al. (U.S. Patent Number 6,274,058). Applicants respectfully traverse the rejection because Rajagopalan does not remedy the deficiencies of EP '467 with respect to independent Claims 6 and 12.

Initially, Applicants also note that the term "sealing element" Claims 10 and 21 has been amended to recite a "valve body." With respect to claims 9-11, Rajagopalan does not teach "removing adhered silicon nitride deposits from CVD reactions on a wall of the reaction chamber at a rate of greater than 2.0 microns/minute." (Claim 6) Rajagopalan does not provide silicon nitride etch rates exceeding 2.0 microns/minute. Rajagopalan also does not teach "removing adhered silicon oxide deposits from CVD reactions on a wall of the reaction chamber at a rate of greater than or equal to about 1.5 microns/minute." (Claim 12) Rajagopalan teaches cleaning rates for silicon oxide lower than 1.5 microns per minute.

Nor would it have been obvious to achieve the recited etch rates at the recited power levels by mere "optimization." In figures 9-11, flow rates are varied to obtain various cleaning rates. "The flow rate of 400 sccm provided the highest clean rate of about 7500 Å/min." (Col 21, lines 34-36) This flow rate of 0.75 µ/min is substantially less than "a rate of greater than or equal to about 1.5 microns/minute." (Claim 12) When power levels are increased, Rajagopalan still does not reach the recited etch rates. When the power level is 3200 W (which is even higher than Applicants' recited "less than 3000 W"), Rajagopalan cleans fluorinated silicon oxide at a rate of less than 1.2 µ/min. (Col 19, lines 32 – 34) Similarly, there is no teaching anywhere in the art that Rajagopalan could or should be adjusted to achieve greater than 2.0 µm/min etch rate on CVD deposits.

Thus, the etch rates recited in the independent claims are not a result of mere adjustment of power levels, contrary to the Examiner's assertions and not merely the result of optimization of a result-effective variable. Accordingly, the skilled artisan would not be taught or motivated to achieve the recited etch rates under the recited conditions of independent Claims 6 and 12.

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Applicants submit that Rajagopalan does not remedy the deficiencies of the rejection of Claims 6 and 12. Thus, Claims 9-11 and 20-22 are allowable because they depend from these claims and retain each and every limitation of these independent claims.

Conclusions

In view of the foregoing amendments and remarks, Applicants respectfully submit that the pending claims are in condition for allowance and request the same. If, however, some issue remains that the Examiner feels can be addressed by Examiner Amendment, the Examiner is cordially invited to call the undersigned for authorization.

Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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